IN THE CLAIMS

Claims 1-20 and 42-56 were previously canceled.

Please cancel claims 21-42 and 57 without prejudice or disclaimer.

Please add new claims 58-76 below.

This listing of claims will replace all prior versions, and listings, of claims in the application. Applicants reserve the right to file a continuation and/or divisional application, as applicable, to capture the subject matter of cancelled claims 1-57.

Listing of Claims:

Claims 1-57 (canceled)

58. A method of making an electronic component, comprising:

(a) providing a self-assembled nanocell, wherein the self-assembled nanocell comprises:

at least one input lead;

at least one output lead; and

a random nano-network spanning the input lead and the output lead, wherein the random nano-network comprises molecular circuit components and nanoparticles, wherein the nanoparticles have a functionality of electrical connectors thereby aiding a formation of the molecular circuit components into a conductive network;

(b) programming the nanocell to function as the electronic component, wherein the programming comprises:

(b1) configuring the molecular circuit components, wherein the configuring comprises applying a voltage across the input lead and the output lead so as to adjust a conductivity-affecting property of at least one of the molecular circuit components.

59. The method according to claim 1 wherein the molecular circuit components are selected from the group consisting of molecular switches, molecular diodes, molecular wires, molecular rectifiers, molecular resistors, molecular transistors, molecular memories and combinations thereof.

60. The method according to claim 59 wherein the molecular switches comprise 2',5'-dinitro-4,4'-diphenyleneethynylene-1,4"-benzenedithiol.

61. The method according to claim 60 wherein said providing comprises connecting at least one of the molecular switches to one of the input lead and the output lead.

62. The method according to claim 59 wherein the molecular circuit components comprises molecular resonant tunneling diodes.

63. The method according to claim 62 wherein the molecular circuit components exhibit negative differential resistance.

64. The method according to claim 58 wherein the molecular circuit components include conjugated molecular segments.

65. The method according to claim 58 wherein the conductivity-affecting property is selected from the group consisting of charge, conformational state, electronic state, and combinations thereof.

66. The method according to claim 1 wherein step (b) further comprises:

(b2) testing the performance of the nanocell.

67. The method according to claim 6 wherein step (b) further comprises:

(b3) applying a self-adaptive algorithm to reconfigure the molecular circuit components.

68. The method according to claim 67 wherein the self-adaptive algorithm is selected from the group consisting of genetic algorithms, simulated annealing algorithms, go with the winner algorithms, temporal difference learning algorithms, reinforcement learning algorithms, and combinations thereof.

69. The method according to claim 67 further comprises:

repeating the steps of

(b2) testing the performance of the nanocell; and

(b3) and applying a self-adaptive algorithm.

until the nanocell functions as the electronic component.

70. The method according to claim 58 wherein the electronic component comprises a logic unit.

71. The method according to claim 70 wherein the logic unit is selected from the group consisting of truth tables supported by the input leads and output leads.

72. The method according to claim 71 wherein the logic unit is selected from the group consisting of an AND, an OR, an XOR, a NOR, an NAND, a NOT, an Adder, a Half-Adder, an Inverse Half-Adder, a Multiplexor, a Decoder, and combinations thereof.

73. The method according to claim 58 wherein the electronic component comprises a memory unit.

74. The method according to claim 1 wherein step (a) comprises:

(a1) allowing the plurality of nanoparticles to self-assemble into a random array;

(a2) allowing the plurality of molecular circuit components to self-assemble into a random molecular interconnect between the nanoparticles; and

(a3) bonding the molecular circuit components to the nanoparticles with molecular alligator clips.

75. The method according to claim 74 wherein the molecular alligator clips are selected from the group consisting of sulfur, oxygen, selenium, phosphorous, isonitrile, pyidine, carboxylate, and thiol moieties.

76. The method according to claim 58 wherein the nanocell has a linear dimension between about 1 nm and about 2 μm.